STS-111/ET-113 Flight Readiness Review

External Tank Project

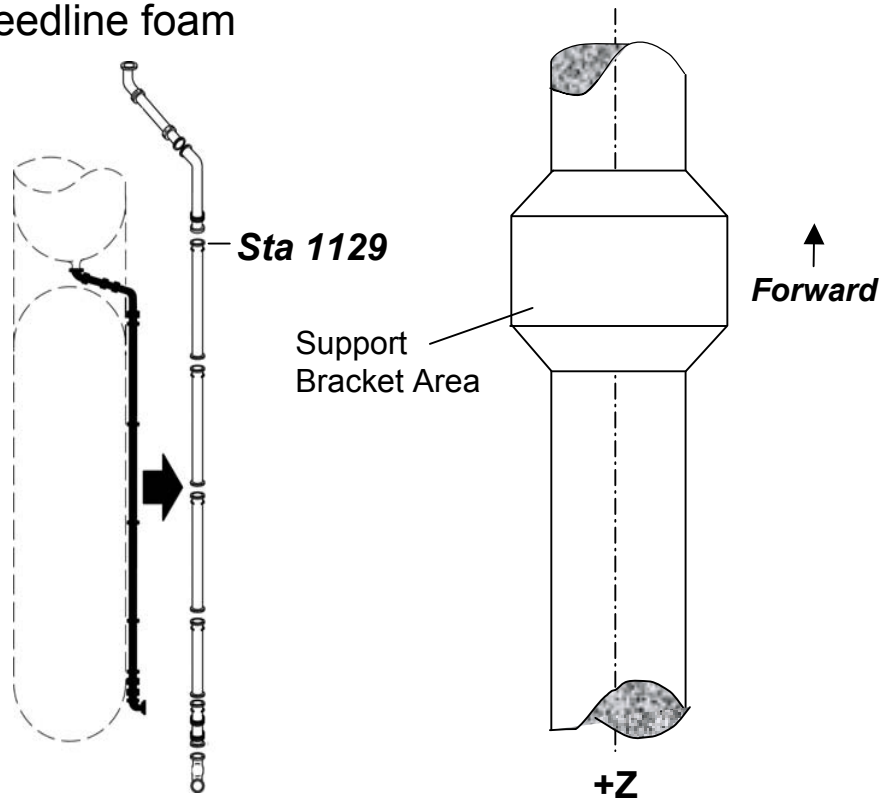
May 16, 2002

Overview

- **Limited Life Component Status**
  - All within required life through scheduled launch date plus 90 days
- **No Significant Changes**
- **Processing Anomaly**
  - Suspect LO2 Feedline Foam
- **Readiness Statement**

Processing Anomaly
Suspect LO2 Feedline Foam

- **Background**
  - Suspect foam debond condition has been isolated to lines with BX-250 foam and to the area at forward end of straight feedline sections near support brackets
    - All line sections on ET-113/STS-111 sprayed with BX-250
    - This area has a thicker initial layer of foam due to the spray start-up process
  - No concern for other BX-250 foam applications on the ET due to process differences
  - Additional data required to establish integrity of feedline foam
- **Actions Taken**
  - Performed plug pulls on ET-113 feedlines
    - Plug pulls at 3 of 4 stations met engineering process specification of 35 psi minimum
      - Plug pulls at Station 1129 did not meet engineering process specification
        - Minimum value = 12.7 psi
        - Maximum length of reduced bond strength is 12.5 inches



Processing Anomaly
Suspect LO2 Feedline Foam

- **ET-113/STS-111 Acceptance Rationale**
  - Acceptance rationale similar to ET-112/STS-109
    - Similar values recorded on ET-112 (12.6 psi at Sta 1623)
      - No debonds
    - Presented to / accepted at STS-109 SSV FRR (02/14/02)
    - Review of post separation film showed no evidence of feedline foam debond
  - Analysis considers pressure entrapped in foam and flight environment (vacuum, heating, LO2 in line, vibration and air loading)
    - Driving environments are the foam cell pressure, cryogenic temperature and the vacuum of space
    - Assumes that this region unbonded
      - Zero psi bond strength vs a measured minimum of 12.7 psi
  - Analysis of ET-113 suspect foam results in a >> 2.0 FS

The External Tank, ET-113, is certified and ready for STS-111 flight pending completion/closure of open and planned work